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### Claims

1. A method of performing authentication of a  
5 subscriber during a subscriber equipment terminated call,  
comprising the steps of  
    sending a session invitation message (S4, S5) to the  
subscriber equipment, the session invitation message  
including authentication information (AuthData1), and  
10 performing an authentication procedure in the  
subscriber equipment by using the authentication  
information.
2. The method according to claim 1, further comprising  
15 the step of  
    sending a response message (S6) as a response to the  
session invitation message from the subscriber equipment  
to the network, the response message including a result  
(AuthData2) of the authentication procedure.
- 20 3. The method according to claim 2, further comprising  
the step of  
    verifying (S8; S7b; S8c) the authentication  
procedure result (AuthData2) in a network control  
25 element.
4. The method according to claim 3, further comprising  
the step of  
    forwarding (S9) the response message of the  
30 subscriber equipment to an originating entity initiating  
the session invitation without the result of the  
authentication procedure in case of a positive  
verification (S8; S7b; S8c).

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5. The method according to claim 3, further comprising the step of

forwarding a failure message to an originating entity initiating the session invitation in case of a

5 negative verification (S8; S7b; S8c).

6. The method according to claim 1, wherein in the network the SIP (Session Initiation Protocol) protocol is adopted as a control protocol.

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7. The method according to claim 6, wherein the session invitation message is a SIP INVITE request including an authentication header field.

15 8. The method according to claim 6, wherein the response message is a SIP response message including an authorization header field.

9. The method according to claim 3, wherein the  
20 verifying step (S8) is performed in a network control element which serves as an originating entity initiating the session invitation.

10. The method according to claim 3, wherein the  
25 verifying step (S7a) is performed in a network control element which serves the subscriber equipment.

11. The method according to claim 3, wherein the  
30 verifying step (S8c) is performed in an authentication center.

12. The method according to claim 1, further comprising the step of

35 sending a response message (S6a) as a response to the session invitation message from the subscriber

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equipment to the network, the response message including a result (AuthData2) of the authentication procedure and network authentication information (AuthData3) which is used by the subscriber equipment to perform an  
5 authentication of the network.

13. The method according to claim 12, further comprising the steps of

determining (S11) a network authentication result  
10 (AuthData4) in response to the network authentication information (AuthData4) by the network,  
sending (S12) the network authentication result (AuthData4) to the subscriber equipment, and  
verifying (S13) the network authentication result  
15 (AuthData4) in the subscriber equipment.

14. The method according to claim 3, wherein the authentication procedure performing step and the verification step (S8; S7b; S8c) are repeated a  
20 predetermined number of times, wherein different authentication information (AuthData1) are used.

15. A network system comprising a subscriber equipment and at least one network control element, wherein, during  
25 a subscriber equipment terminated call,

the network control element is adapted to send a session invitation message to the subscriber equipment, the session invitation message including authentication information (AuthData1), and

30 the subscriber equipment is adapted to perform an authentication procedure by using the authentication information.

16. The network system according to claim 17, wherein  
35 the subscriber equipment is adapted to send a response

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message as a response to the session invitation message to the network, the response message including a result (AuthData2) of the authentication procedure.

5 17. The network system according to claim 16, wherein the network control element is adapted to verify the authentication procedure result (AuthData2).

10 18. The network system according to claim 17, wherein the network control element is adapted to forward the response message of the subscriber equipment to an originating entity initiating the session invitation without the result of the authentication procedure in case of a positive verification.

15 19. The network system according to claim 17, wherein the network control element is adapted to forward a failure message to an originating entity initiating the session invitation in case of a negative verification.

20 20. The network system according to claim 15, wherein in the network the SIP (Session Initiation Protocol) protocol is adopted as a control protocol

25 21. The network system according to claim 20, wherein the session invitation message is a SIP INVITE request including an authentication header field.

30 22. The network system according to claim 20, wherein the response message is a SIP response message including an authorization header field.

23. The network system according to claim 17, wherein the network control element performing the verification

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is adapted to serve an originating entity initiating the session invitation.

24. The network system according to claim 17, wherein  
5 the network control element performing the verification is adapted to serve the subscriber equipment.

25. The network system according to claim 17, wherein  
the network control element performing the verification  
10 is an authentication center.

26. The network system according to claim 15, wherein  
the subscriber equipment is further adapted to send a  
response message as a response to the session invitation  
15 message from the subscriber equipment to the network, the response message including a result (AuthData2) of the authentication procedure and network authentication information (AuthData3) which is used by the subscriber equipment to perform an authentication of the network.

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27. The network system according to claim 26, wherein  
the network control element is further adapted to  
determine a network authentication result (AuthData4) in  
response to the network authentication information  
25 (AuthData4) and to send the network authentication result (AuthData4) to the subscriber equipment, and

the subscriber equipment is adapted to verify the network authentication result (AuthData4).

30 28. The network system according to claim 17, wherein  
the network control element and the subscriber equipment are adapted to repeat the authentication procedure and the verification for a predetermined number of times, wherein different authentication information (AuthData1)  
35 are used.

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29. A network control element, wherein, during a subscriber equipment terminated call, the network control element is adapted

5       to send a session invitation message to the subscriber equipment, the session invitation message including authentication information.

10       30. The network control element according to claim 29, wherein the network control element is adapted to receive a response message as a response to the session invitation message from a subscriber equipment, the response message including a result of an authentication procedure performed by the subscriber equipment.

15       31. The network control element according to claim 30, wherein the network control element is adapted to verify the authentication procedure result.

20       32. The network control element according to claim 31, wherein the network control element is adapted to forward the response message of the subscriber equipment to an originating entity initiating the session invitation without the result of the authentication procedure in  
25       case of a positive verification.

30       33. The network control element according to claim 31, wherein the network control element is adapted to forward a failure message to an originating entity initiating the session invitation in case of a negative verification.

35       34. The network control element according to claim 29, wherein in the network the SIP (Session Initiation Protocol) protocol is adopted as a control protocol,

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35. The network control element according to claim 34, wherein the session invitation message is a SIP INVITE request including an authentication header field.

5 36. The network control element according to claim 34, wherein the response message is a SIP response message including an authorization header field.

10 37. The network control element according to claim 31, wherein the network control element performing the verification is adapted to serve an originating entity initiating the session invitation.

15 38. The network control element according to claim 31, wherein the network control element performing the verification is adapted to serve the subscriber equipment.

20 39. The network control element according to claim 29, wherein the network control element is adapted determine whether it has to perform a verification of the authentication or not.

25 40. The network according to claim 39, wherein the network control element is adapted to, in case the network control element does not have to perform the verification, forward a scheduled result (AuthResp) to a second network control element by including the scheduled result into the session invitation message.

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42. The network according to claim 40, wherein the network control element is adapted, in case the network control element has to perform the verification,

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to receive the scheduled result (AuthResp) from another network control element, wherein the scheduled result is included in the session invitation message,

to extract the scheduled result (AuthResp) from the session invitation message and to forward the session invitation message without the scheduled result (AuthResp) to the subscriber equipment, and

to verify the authentication result (AuthData2) with a scheduled result (AuthResp).

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43. The network control element according to claim 29, wherein the network control element is further adapted to receive a response message from the subscriber equipment, the response message including a result (AuthData2) of the authentication procedure and network authentication information (AuthData3) which is used by the subscriber equipment to perform an authentication of the network.

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44. The network system according to claim 43, wherein the network control element is further adapted to determine a network authentication result (AuthData4) in response to the network authentication information (AuthData4) and to send the network authentication result (AuthData4) to the subscriber equipment.

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45. The network system according to claim 31, wherein the network control element is adapted to repeat the verification for a predetermined number of times, wherein different authentication information (AuthData1) are used.

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46. A subscriber equipment which is adapted to be connected to a network, and, during a subscriber equipment terminated call,



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to receive a session invitation message from the network, the session invitation message including authentication information, and

to perform an authentication procedure by using the authentication information.

47. The subscriber equipment according to claim 46, wherein the subscriber equipment is adapted to send a response message as a response to the session invitation message to the network, the response message including a result of the authentication procedure.

48. The subscriber equipment according to claim 47, wherein in the network the SIP (Session Initiation Protocol) protocol is adopted as a control protocol.

49. The subscriber equipment according to claim 48, wherein the session invitation message is a SIP INVITE request including an authentication header field.

50. The subscriber equipment according to claim 49, wherein the response message is a SIP response message including an authorization header field.

51. The subscriber equipment according to claim 46, wherein the subscriber equipment is further adapted to send a response message as a response to the session invitation message from the subscriber equipment to the network, the response message including a result (AuthData2) of the authentication procedure and network authentication information (AuthData3) which is used by the subscriber equipment to perform an authentication of the network.

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52. The subscriber equipment according to claim 51,  
wherein the subscriber equipment is further adapted to  
received a network authentication result (AuthData4) from  
the network, and

5       the subscriber equipment is adapted to verify the  
network authentication result (AuthData4).

52. The network system according to claim 46, wherein  
the subscriber equipment is adapted to repeat the  
10 authentication procedure for a predetermined number of  
times.

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